

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
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in its capacity as elected Office

Date of mailing (day/month/year) 26 May 2000 (26.05.00)		
International application No. PCT/FI99/00774	Applicant's or agent's file reference 2980379PC/nu	
International filing date (day/month/year) 20 September 1999 (20.09.99)	Priority date (day/month/year) 21 September 1998 (21.09.98)	
Applicant VERKAMA, Markku et al		

1. The designated Office is hereby notified of its election made:

☒

in the demand filed with the International Preliminary Examining Authority on:

19 April 2000 (19.04.00)

☐

in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was☐

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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15 JAN 2001

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2980379PC/nu	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI99/00774	International filing date (day/month/year) 20.09.1999	Priority date (day/month/year) 21.09.1998
International Patent Classification (IPC) or national classification and IPC7 H04Q 7/22, H04L 29/06		
Applicant Nokia Networks OY, et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☒ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19.04.2000	Date of completion of this report 08.01.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Nabil Ayoub/JAn Telephone No. 08-782 25 00

I. Basis of the report1. With regard to the **elements** of the international application:*☒ the international application as originally filed☐ the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement) under article 19

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages _____☐ the claims, Nos. _____☐ the drawings, sheet/fig _____5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

II. Priority

1. ☐ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
- ☐ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1).

Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Priority is considered valid, therefore document WO 9843446 is of no relevance.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-12</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The claimed invention relates to a mechanism for providing mobility for an Internet-type protocol in a packet radio network such as GPRS or UMTS.

The claimed invention intends to save IP addresses and radio resources. The goal is achieved by integrating a foreign agent (FA) into one of the support nodes (SGSN). A care-of-address (COA) is provided for the mobile station and the IP address of the foreign agent is used as the COA of the mobile station.

Document cited in the International Search Report:

D1: WO, 9840988, A

D2: Geiger R.L. ET AL: "Wireless Network Extension using Mobile IP", Digest of papers of compcon 1996, technologies for the Information Superhighway, Feb. 25-28, 1996, no. of conf. 41, pages 9 - 14, see page 13; fig 3

D3: US, 5793762, A

D4: US, 9621983, A

D1 discloses a mobility support node for providing access between a telecommunication station and a data network. The mobility support node comprises a server, an access support means and a foreign agent (see fig. 5). When the mobile station is registered with the server, it is given a long term IP-address and a home network. The home address is administrated in the same way as a permanent IP-address is provided to a stationary host. The access support means sets up an association between the Internet protocol IP-address in a foreign agent of the data network with which the mobile station is registered and the server. When away from the home network, a care-of address is associated with the mobile station and reflects the current attachment point of the mobile station. The access support means registers the mobile station through the foreign agent to a home agent (HA) of the mobile station.

.../...

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V

When a data packet is sent to the mobile station. The home agent (HA) attached to the Internet (see fig. 5) knows that the mobile station is registered at the foreign agent and the data packet intercepted by the home agent (HA) is tunnelled to the care-of address in the foreign agent. The data packet is then detunnelled by the foreign agent and sent to the mobile station (see page 21 line 17 - page 22 line 2).

D1 differs from the claimed invention in claims 1, 9 and 12 in that D1 does not state that the foreign agent is installed in the packet radio network and integrated into one of the support nodes (SGSN, GGSN). It is not considered obvious to a person skilled in the art to change the method of D1 so as to reach a method or arrangement as the one claimed in the present invention.

D2 describes some of the challenges and solutions to providing wireless network access for mobile computing users. The basic architecture of the system, as it relates to packet data services, is shown in figure 3. The base stations are linked to a data gateway, which is responsible for locating users in the cells and routing IP packet traffic appropriately. The data gateway is connected to one or more mobile IP foreign agent (FA), which is in turn connected to a wide area network (see fig. 3).

D3 shows a system and method for providing Internet data and voice services to mobile subscribers. The system and method describe the need for a mobile telephone switch and can include at least one mobile terminal having the functionality of a mobile host, at least one Home Location Register (HLR), a data base, a plurality of Radio Port Controllers (RPCs) in communication with at least one Radio Port (RP), an internet access node, a home agent, a Correspondent Host (CH) and a Visitor Location Register/Directory Number Manager (VLR/DN-MGR). The HLR is operative to store and provide subscription data and keep track of where at least one mobile terminal is registered in order to deliver calls thereto.

D4 describes a protocol-independent routing of data packets between a mobile station of a packet radio network and a party (Host) connected to an external network. A data packet network is connected to other packet radio networks, data networks or the backbone network between packet data networks via a gateway node (GPRS GSN), which uses the network-internal protocol towards the dedicated packet network and the protocol of each network towards other networks. .../...

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V

When a data packet is transferred via a gateway node from a network into another network, the data packet is encapsulated in a packet according to the protocol of the new network.

None of these documents (D2 through D4) disclose any method for providing Internet protocol-type mobility for a mobile station, wherein a foreign agent having an IP address is installed into a packet radio network and integrated into one of the support nodes (SGSN, GGSN), as defined in present claims 1, 9 and 12. It is not considered obvious to a person skilled in the art to change the method of any of the above mentioned documents so as to reach a method or arrangement as the one claimed in the present invention.

The claimed invention in claims 1 - 12 is thus novel and is considered to involve an inventive step. The invention as claimed in claims 1 - 12 is considered to have industrial applicability.

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day month year)	Filing date (day month year)	Priority date (valid claim) (day month year)
WO 9843446	01.10.98	24.03.98	25.03.97

2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day month year)	Date of written disclosure referring to non-written disclosure (day/month/year)

INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/FI 99/00774

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04Q 7/22, H04L 29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04Q, H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9840988 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 17 Sept 1998 (17.09.98), page 17, line 4 - page 18, line 12; page 21, line 16 - page 22, line 2	1-2,4,8-10, 12
Y	--	3,5-7,11
Y	Geiger R.L. ET AL: "Wireless Network Extension using Mobile IP", Digest of papers of compcon 1996, Technologies for the Information Superhighway, Feb. 25-28, 1996, no. of conf. 41, pages 9 - 14, see page 13; fig 3	3,5-7,11
P,X	WO 9843446 A2 (TELEFONAKTIEBOLAGET LM ERICSSON), 1 October 1998 (01.10.98), page 16, line 20 - page 19, line 17	1-2,4,8-10, 12
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"F" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

Date of mailing of the international search report

21 March 2000

24 -03- 2000

Name and mailing address of the ISA/
Swedish Patent Office
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Facsimile No. +46 8 666 02 86

Authorized officer

Nabil Ayoub/cs
Telephone No. +46 8 782 25 00

2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 99/00774

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5793762 A (JOHN HENRY JUBERT PENNERS ET AL), 11 August 1998 (11.08.98), column 7, line 52 - column 8, line 18; column 9, line 40 - column 10, line 16 --	1,9,12
A	WO 9621983 A1 (NOKIA TELECOMMUNICATIONS OY), 18 July 1996 (18.07.96), page 12, line 29 - page 18, line 3 -- -----	1,9,12

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.

PCT/FI 99/00774

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
WO	9840988	A1	17/09/98	AU	3052897 A	05/01/98
				AU	6427498 A	29/09/98
				DE	29780445 U	26/08/99
				SE	9700895 A	14/09/98

WO	9843446	A2	01/10/98	AU	6531598 A	20/10/98

US	5793762	A	11/08/98	US	5457736 A	10/10/95

WO	9621983	A1	18/07/96	AU	702765 B	04/03/99
				AU	4392896 A	31/07/96
				CA	2209715 A	18/07/96
				CN	1173954 A	18/02/98
				EP	0804844 A	05/11/97
				FI	1989 U	06/07/95
				FI	98586 B,C	27/03/97
				FI	950116 A,V	11/07/96
				JP	10512409 T	24/11/98
				NO	973177 A	09/09/97
US	5970059 A	19/10/99				



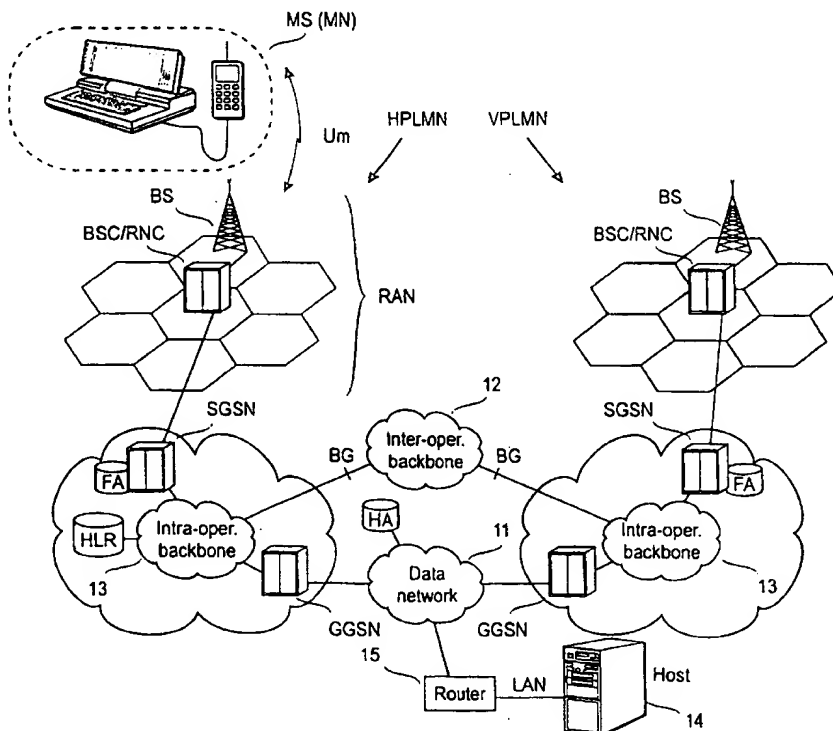
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H04Q 7/22, H04L 29/06	A3	(11) International Publication Number: WO 00/18155
		(43) International Publication Date: 30 March 2000 (30.03.00)
(21) International Application Number: PCT/FI99/00774		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 20 September 1999 (20.09.99)		
(30) Priority Data: 982027 21 September 1998 (21.09.98) FI		
(71) Applicant (for all designated States except US): NOKIA NETWORKS OY [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).		
(72) Inventors; and (75) Inventors/Applicants (for US only): VERKAMA, Markku [FI/FI]; Hakamäki 2 A 12, FIN-02120 Espoo (FI). FLYKT, Patrik [FI/FI]; Silmupolku 1 A 6, FIN-00380 Helsinki (FI). HAUMONT, Serge [FR/FI]; Riistavuorenkuja 3 B 10, FIN-00320 Helsinki (FI).		
(74) Agent: KOLSTER OY AB; Iso Roobertinkatu 23, P.O. Box 148, FIN-00121 Helsinki (FI).		Published <i>With international search report.</i>
		(88) Date of publication of the international search report: 25 May 2000 (25.05.00)

(54) Title: IP MOBILITY MECHANISM FOR A PACKET RADIO NETWORK

(57) Abstract

An arrangement for providing IP mobility for a mobile station (MS). The mobile station (MS) has a care-of-address (COA) for routing data packets when the MS is away from home. The arrangement comprises support nodes, called access nodes (SGSN), and gateway nodes (GGSN), and a foreign agent (FA) having an IP address. In order to save IP addresses and radio resources the foreign agent (FA) is integrated into one of the support nodes (SGSN), and the IP address of, or provided by, the foreign agent (FA) is also used as the mobile station's (MS) care-of-address (COA).



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Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia						

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2980379PC/nu

PCT REQUEST

Original (for SUBMISSION) - printed on 20.09.1999 11:16:06 AM

0 0-1	For receiving Office use only International Application No.	PCT/FI 99 / 0 0 7 7 4
0-2	International Filing Date	20 SEP 1999 (20.09.99)
0-3	Name of receiving Office and "PCT International Application"	The Finnish Patent Office PCT International Application
0-4 0-4-1	Form - PCT/RO/101 PCT Request Prepared using	PCT-EASY Version 2.84 (updated 01.07.1999)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	National Board of Patents and Registration (Finland) (RO/FI)
0-7	Applicant's or agent's file reference	2980379PC/nu
I	Title of invention	IP MOBILITY MECHANISM FOR A PACKET RADIO NETWORK
II II-1 II-2 II-4 II-5	Applicant This person is: Applicant for Name Address:	applicant only all designated States except US NOKIA TELECOMMUNICATIONS OY Keilalahdentie 4 FIN-02150 Espoo Finland
II-6 II-7	State of nationality State of residence	FI FI
III-1 III-1-1 III-1-2 III-1-4 III-1-5	Applicant and/or inventor This person is: Applicant for Name (LAST, First) Address:	applicant and inventor US only VERKAMA, Markku Hakamäki 2 A 12 FIN-02120 Espoo Finland
III-1-6 III-1-7	State of nationality State of residence	FI FI

PCT REQUEST

Original (for SUBMISSION) - printed on 20.09.1999 11:16:06 AM

III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	FLYKT, Patrik
III-2-5	Address:	Silmupolku 1 A 6 FIN-00380 Helsinki Finland
III-2-6	State of nationality	FI
III-2-7	State of residence	FI
III-3	Applicant and/or inventor	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	HAUMONT, Serge
III-3-5	Address:	Riistavuorenkuja 3 B 10 FIN-00320 Helsinki Finland
III-3-6	State of nationality	FR
III-3-7	State of residence	FI
IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name	KOLSTER OY AB
IV-1-2	Address:	Iso Roobertinkatu 23 P.O. Box 148 FIN-00121 Helsinki Finland
IV-1-3	Telephone No.	358 9 618 821
IV-1-4	Facsimile No.	358 9 602 244
IV-1-5	e-mail	kolster@kolster.fi
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AP: GH GM KE LS MW SD SL SZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT

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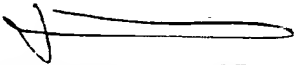
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V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	AE AL AM AT (patent and utility model) AU AZ BA BB BG BR BY CA CH&LI CN CR CU CZ (patent and utility model) DE (patent and utility model) DK (patent and utility model) DM EE (patent and utility model) ES FI (patent and utility model) GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK (patent and utility model) SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW	
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.		
V-6	Exclusion(s) from precautionary designations	NONE	
VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	21 September 1998 (21.09.1998)	
VI-1-2	Number	982027	
VI-1-3	Country	FI	
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	International Searching Authority Chosen	Swedish Patent Office (ISA/SE)	
VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	8	-
VIII-3	Claims	2	-
VIII-4	Abstract	1	2980379p.txt
VIII-5	Drawings	2	-
VIII-7	TOTAL	17	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-10	Copy of general power of attorney	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-17	Other (specified):	Copy of Official Action	-

PCT REQUEST

2980379PC/nu

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VIII-18	Figure of the drawings which should accompany the abstract	1
VIII-19	Language of filing of the international application	English
IX-1	Signature of applicant or agent	 Tapio Valkeiskangas
IX-1-1	Name	KOLSTER OY AB

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	20 SEP 1999	(20-09-1999)
10-2	Drawings:		
10-2-1	Received		
10-2-2	Not received		
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application		
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)		
10-5	International Searching Authority	ISA/SE	
10-6	Transmittal of search copy delayed until search fee is paid		

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